Reprint Includes Change 1

AC 150/5345-7D

CHANGE 1

DATE 1/4/82

ADVISORY CIRCULAR

CHANGE

DEPARTMENT OF TRANSPORTATION
Federal Aviation Administration
Washington, D.C.

Subject: Change 1 to SPECIFICATION FOR L-824 UNDERGROUND ELECTRICAL CABLE FOR AIRPORT LIGHTING CIRCUITS--Revises Equipment Qualification Procedures

1. PURPOSE. This Change revises the procedures for obtaining equipment qualification approval as contained in paragraph 4.

2. EXPLANATION. Procedures for obtaining equipment qualification approval are now contained in AC 150/5345-1G, Approved Airport Lighting Equipment, and supersede those contained in paragraph 4 of this advisory circular.

3. FILING THIS CHANGE. This Change should be filed on the front of the advisory circular. Page changes to reflect this revision will be made at a later date.

Leonard E Mudd

LEONARD E. MUDD
Director, Office of Airport Standards

Suggest filing this transmittal at the bock of the AC. it will provide a reference authority for changes, a method of determining that all Changes hove been received. and a check for determining if the AC contains the proper pogn.

Initiated by: AAS-200

AC 150/5345-7D

DATE 5/19/81

ADVISORY CIRCULAR

DEPARTMENT OF TRANSPORTATION
Federal Aviation Administration
Washington, D.C.

Subject: SPECIFICATION FOR L-824 UNDERGROUND ELECTRICAL CABLE FOR AIRPORT LIGHTING CIRCUITS

1. PURPOSE. This advisory circular contains the specifications for L-824 electrical cable.

2. PRINCIPAL CHANGES. Significant changes included in this revision are:

a. Reclassification of Types A and B cable as Type A with two voltage ratings.

b. Inclusion of ethylene-propylene-rubber-insulated cable with two voltage ratings as Type B cable.

c. Updating of ICEA (formerly IPCEA) publication references.

3. CANCELLATION. Advisory Circular 150/5345-7C, Specification for L-824 Underground Electrical Cable for Airport Lighting Circuits, dated February 4, 1976, is cancelled.

Leonard E. Mudd

LEONARD E. MUDD
Acting Associate Administrator for Airports

Initiated by: AAS-200

SPECIFICATION FOR L-824 UNDERGROUND ELECTRICAL CABLE FOR AIRPORT LIGHTING CIRCUITS

1. SCOPE AND CLASSIFICATION.

1.1 Scope. This specification covers requirements for underground electrical cable intended for use in airport lighting circuits.

1.2 Classification. This specification provides for three types and two voltage ranges of underground electrical cable.

Type A. Single and multiple conductor cables rated 600 volts and 5000 volts having rubber insulation and an overall jacket.

Type B. Single and multiple conductor cables rated 600 volts and 5000 volts having ethylene propylene insulation and an overall jacket.

Type C. Single and multiple conductor cables rated 600 volts and 5000 volts having cross-linked polyethylene insulation. Multiple conductor cables shall have an overall jacket.

2. APPLICABLE DOCUMENTS.

2.1 General. The following documents of the issue in effect on the date of request for approval form a part of this specification to the extent specified herein. In case of conflict, this specification shall govern.

2.1.1 Federal Aviation Administration (FAA) Standard.

FAA-STD-013 Quality Control Program Requirements

2.1.2 Insulated Cable Engineers Association, Inc. (ICEA, formerly IPCEA) Publications):

ICEA S-19-81/NEMA WC 3-1980, Rubber-insulated Wire and Cable for the Transmission and Distribution of Electrical Energy

ICEA S-68-516/NEMA WC 8-1976, Ethylene-propylene-rubber-insulated Wire and Cable for the Transmission and Distribution of Electrical Energy

ICEA S-66-524/NEMA WC 7-1971, Cross-linked-thermosetting-polyethylene-insulated Wire and Cable for the Transmission and Distribution of Electrical Energy

(Copies of FAA standards may be obtained from the Federal Aviation Administration, Airway Facilities Service, Washington, D.C. 20591.)

(Copies of the above ICEA/NEMA publications may be obtained from the National Electrical Manufacturers Association, 2101 L Street, N.W., Suite 300, Washington, D.C. 20037.)

3. REQUIREMENTS.

3.1 General. The cable shall be suitable for the intended. application and shall be manufactured consistent with the best commercial practice.

3.1.1 Detail Requirements. The specified cable type shall be manufactured in accordance with the requirements and options, where applicable, specified in table 1.

3.2 Marking. The cable shall be durably marked with the manufacturer's name or trademark, cable trade name or catalog number, conductor size and voltage rating. The markings shall be repeated at regular intervals not exceeding 24 inches (0.6 m). The markings shall not decrease the jacket or'insulation thickness to less than the specified value.

4. QUALITY ASSURANCE PROVISIONS.

4.1 Qualification Requirements.

4.1.1 Qualification Request. Requests for qualification approval must be submitted in writing to the Office of Airport Standards, Attention: AAS-200, Federal Aviation Administration, Washington, D.C. 20591. This request must include:

a. A list of the types and voltage ratings of cable, along with the manufacturer's identification numbers, for which qualification approval is requested.

b. A copy of proposed test procedures and test data sheets and a statement as to whether the manufacturer proposes to conduct the tests or name and location of the independent testing laboratory where the tests are to be conducted (4.1.2).

c. A copy of the manufacturer's proposed guarantee for the cable (4.1.4).

d. A copy of the manufacturer's quality control plan (4.1.3).

4.1.2 Qualification Testing. The cable must pass all tests in 4.2. The manufacturer shall supply all test equipment and bear all testing costs. Tests may be conducted at the manufacturer's plant if facilities are available or at an independent test laboratory acceptable to the FAA. The FAA reserves the right to witness any or all tests and is to be provided with 14 days' advance notificationoi testing. Where the FAA waives the option to witness tests, the manufacturer must submit a certified copy of all test reports.

4.1.3 Quality Control Provisions. The manufacturer shall provide and maintain a quality control'program in accordance with FAA-STD-013 except that facilities for an FAA Quality Assurance Representative are not required.

4.1.4 Guarantee. The manufacturer shall provide the following minimum guarantee for each cable: that the cable has been manufactured and will perform in accordance with this specification and that any defect in material or workmanship which may occur during proper and normal use during a period of 1 year from date of installation or a maximum of 2 years from date of shipment will be corrected or replaced by the manufacturer.

4.1.5 Qualification Approval. Manufacturers who have met all requirements specified herein will be listed as approved suppliers in AC 150/5345-1, Approved Airport Lighting Equipment. Once approval has been granted, the manufacturer may not make any changes to the cable without prior FAA approval. Requests for changes to approved cable must be submitted to the office listed in 4.1.1 and must be accompanied by supporting documentation for the change.

4.2 Qualification Testing. Qualification testing shall be performed on each insulation type and voltage rating of cable as specified in table 1.

4.3 Production Testing. Production tests on cable furnished to this specification shall be performed at a frequency sufficient to assure compliance with all requirements of this specification.

4.4 Production Test Records. At any time after approval has been granted under this specification, a certified copy of factory test reports on the most recent runs of any type of cable meeting this specification shall be made available by the manufacturer upon written request by the FAA.

Table 1. Cable Requirements.

CABLE TYPE	A				C	
VOLTAGE RATING, VOLTS	600	5000	600	5000	600	5000
CONDUCTOR						
a. Material: Coated and uncoated copper	X	X	X	X	X	X
b. General Requirements:						
ICEA S-19-81, Part 2	X	X	--	--	--	--
ICEA S-68-516, Part 2	--	--	X	X	--	--
ICEA S-66-524, Part 2	--	--	--	--	X	X
c. Stranding: 7-wire Class B strand, or	X	X	X	X	X	X
19-wire Class C strand	--	X	--	X	--	X
d. Size: AWG	12-4	8-4	12-4	8-4	12-4	8-4
e. Conductor stress control (conductor shield)						
ICEA S-19-81, Part 2	--	tional	--	--	--	--
ICEA S-68-516, Part 2	--	--	--	Optional	--	--
ICEA S-66-524, Part 2	--	--	--	--	--	Optional
INSULATION						
a. Material:						
Rubber, heat and moisture resistant						
ICEA S-19-81, Par. 3.11 (60oC)	X	--	--	--	--	--
Par. 3.13 (75%)	X	--	--	--	--	--
Ozone resisting rubber						
ICEA S-19-81, Par. 3.14 (75°C)	--	X	--	--	--	--
Par. 3.15 (85°C)	--	X	--	--	--	--
Ethylene propylene rubber						
ICEA S-68-516, Par. 3.6 (90°C)	--	--	X	X	--	--
Par. 3.7 (90°C)	--	--	X	X	--	--
Cross-linked polyethylene						
ICEA S-66-524, Par. 3.6 (90°C)		--	--	--	X	--
Par. 3.7 (90°C)	--	--	--	--	--	X
b. Thickness:						
ICEA S-19-81, Table 3-2	X	X	--	--	--	--
ICEA S-68-516, Table 3-1 column B	--	--	X	--	--	--
Par. 7.9.3	--	--	--	X	--	--
ICEA S-66-524, Table 3-1 column A (single cond.						
column B (multi-cond.)	--	--	--	--	X	--
Tables 7.6-1, 7.6-2, 3-1 (shld.)	--	--	--	--	--	X
SHIELDING						
Nonmetallic covering and metallic tapes:						
ICEA S-19-81, Par. 4.1	--	Optional	--	--	--	--
ICEA S-68-516, Par. 4.1	--	--	--	Optional	--	--
ICEA S-66-524, Par. 4.1	--	--	--	--	--	Optional
MULTIPLE CONDUCTOR CABLE						
Cable assembly:						
ICEA S-19-81, Part 5	X	--	--	--	--	--
ICEA S-68-516, Part 5	--	--	X	--	--	--
ICEA S-66-524, Part 5	--	--	--	--	X	--
JACKET						
a. Material:						
Heavy duty neoprene						
ICEA S-19-81, Par. 4.13.3	X	X	--	--	--	--
ICEA S-68-516, Par. 4.4.3	--	--	X	X	--	--
ICEA S-66-524, Par. 7.4.7.1	--	--	--	--	Multi-Cond	Shielded
Heavy duty chlorosulfonated polyethylene						
ICEA S-19-81, Par. 4.13.9	X	X	--	--	--	--
ICEA S-68-516, Par. 4.4.9	--	--	X	X	--	--
ICEA S-66-524, Par. 7.4.7.3	--	--	--	--	Multi-Cond	Shielded
Polyvinyl chloride						
ICEA S-68-516, Par. 4.4.5	--	--	X	X	--	--
ICEA S-66-524, Par. 4.3.1	--	--	--	--	Multi-Cond	Shielded
Polyethylene						
ICEA S-68-516, Par. 4.4.6	--	--	X	X	--	--
ICEA S-66-524, Par. 4.3.2	--	--	--	--	Multi-Cond	Shielded

Table 1. Cable Requirements--Continued.

CABLE TYPE	I	A	B		C	
VOLTAGE RATING, VOLTS	600	5000	600	5000	600	5000
JACKET (continued)						
b. Thickness:						
(1) Single conductor, nonshielded						
ICEA S-19-81, Table 4-15	X	X	--	--	--	a-
ICEA S-68-516, Table 4-6	m-	--	X	X	--	--
(2) Single conductor, shielded						
ICEA S-19-81, Table 4-16	--	X	--	--	--	--
ICEA S-68-516. Table 4-3	--	--	--	X	--	--
ICEA S-66-524, Table 4-3	--	--	--	--	--	X
(3) Multiple conductor						
ICEA S-19-81, Table 4-20 column (4)	X	--	--	--	--	--
ICEA S-68-516, Table 4-6 column (4)	--	--	X	--	--	—
ICEA S-66-524, Table 4-6 column (4)	--	--	--	--	X	—
COMPONENT TESTS						
Conductor, Conductor stress control layer, Insulation, Insulation shield and jacket:						
ICEA S-19-81, Part 6	X	X	--	--	--	—
ICEA S-68-516, Part 6	--	--	X	X	--	--
ICEA S-66-524, Part 6	--	--	--	--	X	X
HIGH VOLTAGE TESTS						
Test methods shall be according to:						
ICEA S-19-81, Par. 6.24	X	X	--	--	--	--
ICEA S-68-516, Par. 6.27	--	--	X	X	--	--
ICEA S-66-524, Par. 6.14	--	--	--	--	X	X
Test voltages shall be in accordance with a, b. c, or d						
a. High voltage - ac						
ICW S-19-81, Table 3-2	x	X	--	--	--	--
ICEA S-68-516, Table 3-1 column B	--	--	X	--	--	--
Par. 7.9.6.1.1	--	--	--	X	--	--
ICEA S-66-524, Table 3-l column A	—	--	--	—	X	--
Table 7.6-l	--	--	--	--	--	X
b. High voltage - dc						
ICEA S-19-81. Table 3-2	X	X	--	--	--	—
ICEA S-68-516, Table 3-l column B	--	--	X	--	--	--
Par. 7.9.6.1.3	--	--	—	X	--	--
ICEA S-66-524, Table 3-1 column A	—	--	--	--	X	--
Table 7.6-l	--	--	--	--	--	X
c. High voltage spark test - ac						
ICEA S-19-81, Table 3-2	X	--	--	--	--	--
ICEA S-68-516, Table 3-1 column B	--	--	X	--	--	--
ICEA S-66-524, Table 3-l column A	--	--	--	--	X	--
d. High voltage spark test - dc						
ICEA S-19-81, Table 3-2	X	--	--	--	--	--
ICEA S-68-516, Table 3-L column B	--	--	X	--	--	--
ICEA S-66-524, Table 3-l column A	--	--	--	--	X	--
DISCHARGE RESISTANCE TESTS						
ICEA S-19-81, Par. 6.20	--	X	--	--	--	--
ICEA S-68-516, Par. 6.23	--	--	--	X	--	--
ICEA S-66-924, Par. 6.11	--	--	--	--	--	X
INSULATION RESISTANCE						
ICEA S-19-81. Par. 6.25	X	X	--	--	--	--
ICEA S-68-516. Par. 6.28	--	--	X	X	--	--
ICEA S-66-524. Par. 6.15	--	--	--	—	X	x